

Abstract ID : 675

Title : Estimating adult harbour seal survival using sparse photo-ID data

Category : Ecology

Student : Doctoral

Preferred Format : Oral Presentation

Abstract : Between the 1988 and 2002 European phocine distemper outbreaks, numbers of harbour seals in the Moray Firth, NE Scotland, increased at an average annual rate of 0.6%; considerably lower than the post-epizootic recovery observed in other European populations. Matrix modelling indicates that population growth is most sensitive to changes in adult survival; prompting the question of whether adult survival in Scottish harbour seals differs from other populations? Individual recognition data from photographic documentation of harbour seal pelage patterns were used to estimate adult survival. Photographic data collected annually over a four-year period, using a Celestron Celstar 8 astronomical telescope connected to a Hitachi KP-D581 K colour digital CCTV camera, documented the presence of individual seals at a single haul-out site. Survival and recapture probabilities were estimated using Cormack Jolly-Seber (CJS) and Jolly-Seber (JS) mark-recapture models in a Bayesian statistical framework. Computer-intensive Markov Chain Monte Carlo (MCMC) methods were used to estimate full probability distributions for the parameters of interest, enabling associated uncertainty to be explicitly analysed and communicated. The most appropriate model was selected using the Deviance Information Criterion (DIC). A total of 95 females, and 10 males were photographically documented during the study period. The best model for both the CJS and JS approaches consisted of temporal variation in probability of capture, with no variation in survival probability. The JS model was selected as it used more of the data, thus providing more precise estimates. The model estimated adult survival at 0.9711 (95% probability intervals of 0.9012 - 0.9992); this is comparable with other populations. This study represents the first use of photo-ID data to estimate pinniped survival. We used just four years of data, in a robust and novel approach, to provide an estimate of adult survival: a key parameter when modelling the population dynamics of any large mammal.